Lake Wilderness Citizen Advisory Committee
2020 Annual Report

October 13, 2020


View from South Shore Looking North
Photo courtesy of Dave Barber

The Lake Wilderness Citizen Advisory Committee (LWCAC) presents the 2020 annual report on the aquatic plant management and lake stewardship activities for Lake Wilderness. The LWCAC is comprised of five Regular voting members and one or more Alternate members. The 2020 members include:

Dave Barber, Chair
Laurie MacKenzie, Vice Chair
Paul Wichelmann, Regular Voting Member
Charles Benedict, Alternate Member #1
Pat Anderson, Alternate Member #2
Sam Whitman, Member Representative, King County Parks and Natural Resources
Amy Shaw, City Member Representative

Background on Lake Wilderness Preservation Association (LWPA) and Lake Wilderness Citizen Advisory Committee (LWCAC).

In January 1994 Lake Wilderness shoreline property owners Patrick W. Anderson, Roger King, and Mac McMonagle formed the Lake Wilderness Preservation Association (LWPA), a volunteer group. They worked to gather community support from other property owners to manage an infestation of Eurasian milfoil (*Myriophyllum spicatum*) a noxious non-native aquatic plant. The LWPA members partnered with King County Surface Water Management Division and obtained a grant to develop the lake's first Integrated Aquatic Vegetation Management Plan (IAVMP) in 1997. The IAVMP, as updated in 2004, continues to guide the aquatic plant management options and actions for Lake Wilderness today, in accordance with the Washington State Department of Ecology Aquatic Plant and Algae General National Pollution Discharge Elimination System Permit. A survey conducted during the development of the original IAVMP revealed that Eurasian milfoil had spread rapidly and dominated the lake.


Eurasian milfoil
(Myriophyllum spicatum)


Eurasian milfoil in the swimming beach - 1998
Photo by LWPA

In 1998, LWPA members canvased Lake Wilderness watershed residents to gather support for the City of Maple Valley's first special assessment district to fund the lake work long-term. The Lake Management District No. 1, established by a simple majority of watershed property owners, was formed in 1998 under Ordinance O-98-57. A whole-lake herbicide treatment was performed that same year which successfully eradicated Eurasian milfoil from the lake.

Pursuant to the creation of the special assessment district, a plant advisory board was formed to oversee the annual work program for the lake. The LWPA informally fulfilled that role until 2002 when Maple Valley City Council adopted Resolution R-02-220 creating the Lake Management District Advisory Committee. The Lake Management District Advisory Committee terminated concurrently with the sunset of the special assessment district in 2006.

The current Lake Wilderness Citizen Advisory Committee was created in 2006 by Council adoption of Resolution R-06-495 as amended by R-07-518, R-08-576, and R16-1073. The duties of the LWCAC are; 1) discuss with the city the annual work program for the lake; 2) provide input and suggestions regarding implementation of the annual work program; 3) work with the City in preparation of educational materials relative to the lake and surrounding watershed; 4) provide input to the city on the preparation of an annual report to the City Council, City Manager, and the LWPA regarding the progress on the work program and health of the lake; 5) support a public meeting on the contents of the annual report.

Background on Eurasian milfoil in Lake Wilderness

Following the discovery of Eurasian milfoil in 1994, and the subsequent whole-lake Sonar treatment in 1998 that successfully eradicated it, the lake remained free of Eurasian milfoil for several years. However, it was found again in the fall of 2002 and was subsequently treated with aquatic herbicides in the summer of 2003. Small infestations of milfoil were found in the lake during the summers of 2005, 2006, and again in years 2008 through 2020. Typically these plants have been located in the boat launch bay and the shallow southwest bay, along the western residential shoreline, in the swimming bay and on occasions up near the Lake Wilderness Lodge shoreline. Once established in the lake, Eurasian milfoil propagates by plant fragments as well as rhizomes, and although it produces seeds, propagation by seed is considered less common.

King County reports that Eurasian milfoil is widespread throughout King County in lakes that closely follow the I-5 corridor. Eurasian milfoil can be spread from lake to lake by plant fragments on boats, boat trailers and fishing gear. With the public boat launch on Lake Wilderness, the reintroduction of Eurasians milfoil is to be expected. Ongoing surveys are a critical element in identifying and controlling this invasive noxious weed and are critical for early identification of new infestations of other invasive weeds or pests such as Brazilian elodea or New Zealand mud snails.

Two professional Eurasian milfoil surveys are conducted each year in Lake Wilderness. The LWPA also conducts two volunteer Eurasian milfoil patrols which are typically done over a two week period in advance of the professional surveys. The LWPA volunteers continue to play an active role in outreach and prevention. They provide and staff a booth at the annual fishing derby over a 24 hour period to inspect every boat and trailer for plant fragments before it enters the lake. Volunteers greet derby participants and discuss the importance of cleaning equipment and fishing gear. They also provide educational information and offer anglers free hot refreshments.

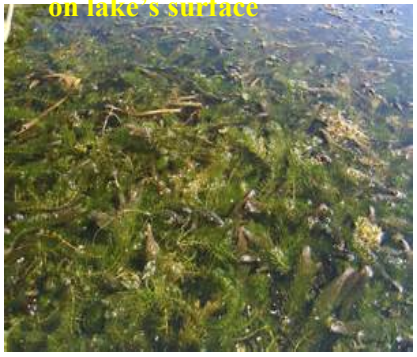
Background on Nuisance Native Aquatic Plants

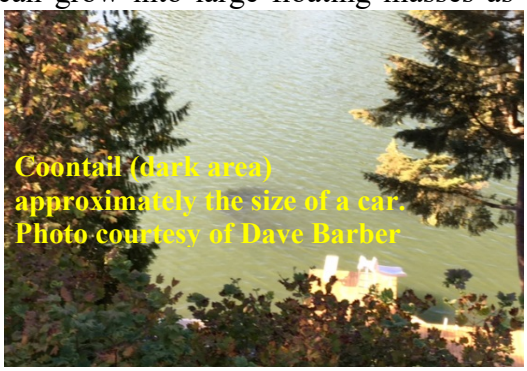
Under favorable conditions, some native pondweed has a tendency for robust growth in the lake's shallow coves and shorelines. It can reach nuisance levels forming dense mats on the lake's surface which can pose a hazard to swimmers and anglers. Herbicide treatments to address nuisance levels of pondweed have been implemented in years 2001, 2004, 2006, 2008, 2009, 2010, 2012 and 2014 through 2020.


Big-leaf pondweed (Potamogeton amplifolius)

The LWPA volunteer patrol has been tracking the growth of the big-leaf pondweed since it was identified in the boat launch bay in 2013. Big-leaf pondweed colonies were increasing in distribution along the western, southern, and eastern shoreline. Shoreline property owners expressed concern that it would soon dominate the entire shoreline. Big-leaf pondweed is a beneficial native plant providing excellent habitat for fish and insects; however, it can exhibit rapid early growth achieving nine feet in length as early as May and twenty feet in length during favorable seasonal conditions. It forms thick mats of floating leaves on the lake surface. In 2019 and 2020 the distribution of the big-leaf pondweed has been reduced. Action to reduce the biomass of big-leaf pondweed is addressed below under *2020 Aquatic Plant Control Recommendation and Actions*.

Since 2014 LWPA volunteers identified Coontail (*Ceratophyllum demersum*) as another aquatic plant they've put on their "watch" list. Coontail is a native underwater rootless perennial plant that forms dense colonies that freely float slightly below or on the surface. It can be confused with Eurasian milfoil and likewise can be very intrusive. It can pose a risk to swimmers and can be a hindrance to fishing and boating. The LWPA have observed that Coontail colonies have been rapidly expanding around the lake. They can grow into large floating masses as seen in the photo above which is approximately the size of a car as shown in the photo on the right.


Floating mass of Coontail on lake's surface

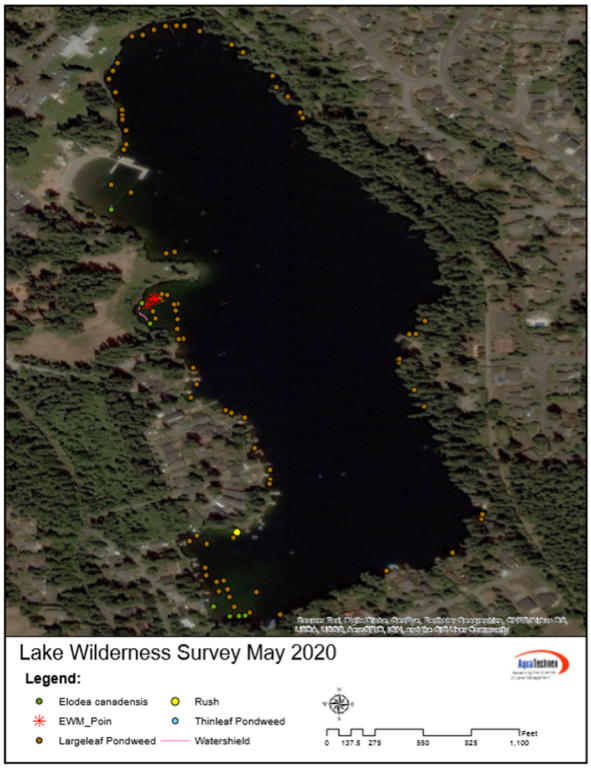

Coontail (dark area) approximately the size of a car. Photo courtesy of Dave Barber

2020 Aquatic Plant Surveys

AquaTechnex, LLC, the city's aquatic plant management vendor, conducted surveys on Lake Wilderness on May 26, 2020 and September 15, 2020. Aquatic biologists conducted a visual systematic survey, by boat and with the use of an underwater drone, of the aquatic plant community along the lake shorelines. They also took rake-toss samples at 5, 10, 15, and 20 foot contours along transects perpendicular to the shoreline at regular intervals around the lake. The LWPA Volunteer Patrol surveyed over several week period preceding

the professional surveys. The 2020 LWPA volunteer milfoil patrol participants were Charles Benedict, Pat Anderson, and Dave Barber.

During the spring 2020 surveys, AquaTechnex and the LWPA found one area in the boat launch bay with Eurasian milfoil plant(s) as depicted by the red star on the survey map to the right. Numerous areas were identified where native big-leaf pondweed had reached nuisance levels by mid-May that adversely impacted beneficial use of the lake in designated high-use zones. This year, the Bulrush was also found to be a nuisance at the shoreline of a property and was selected for treatment. The watershield was noted, and will be monitored for potential future treatment if it becomes a nuisance. The map below shows where treatment was recommended, and subsequently done.



2020 Aquatic Plant Control Recommendation and Actions

2020 Suggested Treatment Areas

An herbicide treatment was recommended and supported by the LWCAC to decrease the amount of the nuisance big-leaf pondweed, mil-foil, and Bulrush. Treatment was done on June 22, 2020 in the tan areas shown on the map on the left. Contact herbicides Aquathol and Diquat Dibromide, both effective on Eurasian milfoil and big-leaf pondweed were used. A systemic herbicide product Clearcast (Imazamox) was used for the bulrush. Washington State Designated Swim Area Guidelines, recommend removal of underwater obstructions, including aquatic plants, in designated swimming areas as part of their state-wide effort to reduce drowning incidents. Public notices by mailing, and shoreline postings, as required under the Washington State Department of Ecology permit, were completed in advance of the treatment. Subsequent late season surveys by AquaTechnex and the LWPA Volunteer milfoil patrol found no Eurasian milfoil and a reduction in the pondweed biomass.

Lake Wilderness CAC 2020 Work Plan

In 2020 the LWCAC approved agendas and meeting minutes at six meetings. Due to recommendations from the Department of Public Health regarding the COVID-19 pandemic, many of the typical LWCAC community and education events could not occur. Education outreach activities in 2020 included the following:

- Between September 2017 and September 30, 2020, Nature Vision, an award winning non-profit environmental education firm, provided classroom workshops on watershed education to 2,218 Tahoma School District (TSD) Elementary School children. After COVID-19 impacted the ability to have in person education, Nature Vision created an education plan including materials that could be downloaded and courses that could be taught remotely to kindergarten through 12th grade. Due to the nature of the program material distribution, the exact number of students that used the materials is unknown, but the number of times that the documents were downloaded could be tracked. As of September 30, 2020, a total of 7,407 documents have been downloaded. Many of these downloads may be teachers who would then distribute the information to their students, parents, and funders. The LWCAC took action to use the annual education budget to increase watershed education efforts. By contracting with Nature Vision, the City is able to provide these programs to TSD at no charge.
- City staff received complaints from concerned residents about illegal dumping of yard waste in the residential areas near Lake Wilderness. City staff used educational funding to install additional signage warning against illegal dumping including yard waste, and also sent out an informational memo on the negative impact that illegal dumping of yard waste has on the environment.
- City staff also received complaints on the increased use of combustion engines on Lake Wilderness with the concern that the signage was not visible or in a good location. Staff from the Public Works and Parks Departments worked together to install updated signs in more visible areas.

Other Lake Wilderness Programs

Volunteer Water Monitoring


Van Dorn bottle used for depth sampling

The volunteer water quality monitoring program for Lake Wilderness dates back to 1974 when volunteers from the community were trained to collect water samples and coordinate data collection and evaluation with staff from the Metropolitan Municipality of Seattle (METRO) Small Lakes Program. In 1995, following METRO's merge with King County, data collection and evaluation responsibilities transferred to the King County Lake Stewardship program (now the Department of Natural Resources and Parks). The program was then funded by the Wastewater Treatment Fund. In 2004 budgetary constraints resulted in those funds being diverted to another priority and King County notified cities that they could no longer fund the volunteer water quality monitoring program for lakes. The City of Maple Valley through Interlocal Agreements with King County began funding the program in 2005.

Volunteer water monitors receive training and equipment from King County. Volunteers measure daily precipitation and lake water levels, surface water temperatures, Secchi transparency, and depth profiles. The program covers a total of twelve sampling events throughout the growing season with routine measurements for concentrations of total phosphorus, total nitrogen, chlorophyll-*a*, soluble reactive phosphorus, nitrate, pH, alkalinity and water color. Volunteers collect samples and coordinate with King County staff for the laboratory analysis.

The Trophic State Index (TSI) is an index that classifies waterbodies based on the total weight of biomass at the time of measurement. The index applies a scale of zero to one hundred based on the summer mean values of three commonly measured lake parameters; Secchi depth, total phosphorus, and chlorophyll-*a*., as indicators of a lake's biomass. Lake Wilderness is considered moderate (mesotrophic) in primary productivity and low (oligotrophic) in Secchi transparency which means that the lake water is very clear. The Volunteer Monitoring Program results indicate water quality in Lake Wilderness is good and phosphorus levels appear to be trending downward.

In 2020 the volunteer water monitor was Paul Wichelmann. The final 2020 water monitoring report from King County typically arrives in the first quarter of the following year and will be posted on the City website once received.

Swimming Beach Monitoring

Lake Wilderness swimming beach bacteria monitoring program began in 2008. In 2019 the program began monitoring for E. coli rather than fecal coliforms. E. coli was found to be a more reliable bacteria indicator of risk to human health. In 2020, nineteen routine weekly samples were drawn on Mondays from the left, center, and right side of the Lake Wilderness swimming beach mid-May through mid-September by King County Lake Stewardship staff.

The swimming beach program follows the Ten State Standard for bacteria. Beach closure occurs when one or both of the following criteria are met: a day's average bacteria value is over 1,000 CFU/100mL (colony forming units per 100 milliliter), or the average of the bacteria values for the three most recent sampling days is over 200 CFU/100 mL calculated using a three-day geomean. The swim beach is reopened when the three-day average bacteria value is below 200 CFU/100 mL and the daily bacteria values from the two most recent sampling days are both below 200 CFU/100mL.

Bacteria Value	Concern Level
Individual value < 200 CFU/100 ml	Low Concern - safe for swimming
Individual value >= 200 & < 1000 CFU/100 ml	Moderate Concern – still safe for swimming
Individual value >=1000 CFU/100 ml or geometric mean >= 200 CFU/100 ml	High Concern – flagged for resample and closure recommended if substantiated

In 2020 the swim beach was closed on one occasion beginning on August 6, 2020 and re-opened on August 27, 2020. Swimming beach data can be viewed at the King County Water and Land Resources swim beach site:

https://green2.kingcounty.gov/swimbeach/BeachData.aspx?locator=O717SB&CurrentYear=true

E-coli measurements are taken only at the swimming beach. We believe that the elevated levels at the beach are not indicative of widespread contamination in the lake and that the remainder of the lake remains safe for swimming.

Cyanobacteria Blooms

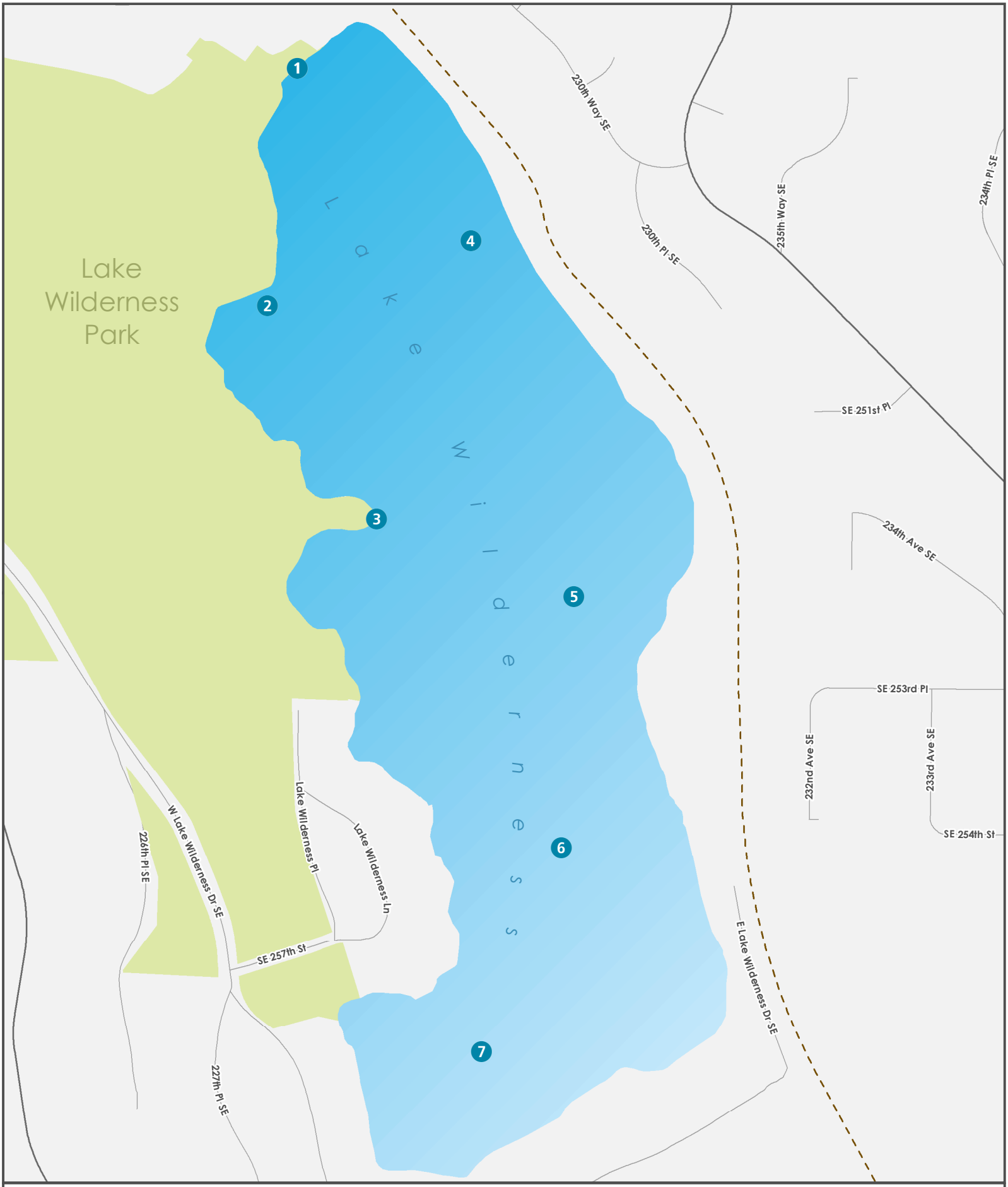
No Cyanobacteria blooms were observed in Lake Wilderness in 2018, 2019, or 2020 as of this report date October 13, 2020, although the fall lake turnover has been associated with Cyanobacteria blooms in Lake Wilderness on some occasions over the years.

Cyanobacteria, formerly known as blue-green algae, are naturally occurring in nature and under certain conditions blooms can cause lake water to appear cloudy and green, or form blue-green, brown or red ribbons of scum on the lake surface. Cyanobacteria can produce toxins that pose health risks to humans and animals. Not all blooms produce toxins, however, the only way to tell whether toxins are present is to have samples analyzed for toxicity by a laboratory. The Washington State Department of Ecology Freshwater Algae Control Program provides for free cyanobacteria toxicity testing for Washington's freshwater lakes when blooms or visible scum formations are detected.

Historical toxic bloom data for Lake Wilderness and other area lakes can be found at the Northwest Toxic Algae website at https://www.nwtoxicalgae.org/

Harmful Algal Blooms

The City procured a Cyanoflour handheld harmful algal bloom indicator device that can be used to give early identification of harmful algal blooms (HABs). The device records phycocyanin levels and chlorophyll levels and creates a ratio of these levels. Monitoring the ratio over time enables users to predict the onset of HABs. City staff created a testing program for Lake Wilderness that originally sampled once a month at the shoreline near the recreation center, the fishing dock, and the peninsula on the west side just north of the boat launch. After discussions with the LWCAC, City staff decided to add four sample locations in the deeper parts of Lake Wilderness as seen on the attached Lake Wilderness HAB Monitoring Points map. As of this report date October 13, 2020, all HAB samples have had low levels that do not indicate a potential bloom.



The City of MAPLE VALLEY

Lake Wilderness HAB Monitoring Points

September 2020

1 - 7 Monitoring Points

C. Walker, MS GISP
September 15, 2020